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CERCLA Closure Plan for the SSA Purge Water Storage Tanks

Idaho Completion Project

Bechtel BWXT Idaho, LLC

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Idaho Falls, Idaho 83415

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ABSTRACT

This document describes a partial closure of a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) waste storage area (10 tanks located at the Staging and Storage Annex, CPP-1789). The tanks are no longer needed for the storage of CERCLA wastes now that the INEEL CERCLA Disposal Facility (ICDF) evaporation pond is available to receive CERCLA aqueous wastes. The Staging and Storage Annex is the CERCLA temporary storage and staging site for CERCLA wastes generated at the Idaho National Engineering and Environmental Laboratory. As the tank system is located at the Staging and Storage Annex, which is part of the ICDF, the tanks will be closed in accordance with the applicable or relevant and appropriate requirements identified in the *Waste Area Group 3, Operable Unit 3-13 Record of Decision* and the *INEEL CERCLA Disposal Facility Complex Remedial Action Work Plan*. The Remedial Action Work Plan identified "clean closure" as the closure approach for ICDF waste storage areas. The applicable or relevant and appropriate requirements for closure of ICDF facilities used for waste storage is Idaho Administrative Procedures Act 58.01.05.008 (40 CFR 264 [Subpart G]). As a CERCLA activity, the substantive requirements of this closure requirement will be performed. This plan specifies the path forward to achieve clean closure of the Staging and Storage Annex tank system.

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ACRONYMS

ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IWTS	Integrated Waste Tracking System
OU	operable unit
RCRA	Resource Conservation and Recovery Act
SSA	Staging and Storage Annex
WAG	waste area group

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1. INTRODUCTION

A partial closure of a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) waste storage area (10 tanks located at the Staging and Storage Annex [SSA], CPP-1789) will be performed. The tanks are no longer needed for the storage of CERCLA wastes now that the INEEL CERCLA Disposal Facility (ICDF) evaporation pond is available to receive CERCLA aqueous wastes. Seven of the 10 tanks have been used to store CERCLA aqueous waste generated in accordance with approved CERCLA work plans. The tanks (referred to as the SSA tank system) will be decontaminated, and the wastes generated from closure activities will be transported to the ICDF for management in accordance with this Closure Plan.

The SSA is the CERCLA temporary storage and staging site for CERCLA wastes generated at the Idaho National Engineering and Environmental Laboratory (INEEL). The ICDF Complex includes the ICDF landfill; the Staging, Storage, Sizing, and Treatment Facility; the evaporation pond; and the SSA. As the tank system is located at the SSA, which is part of the ICDF, the tanks will be closed in accordance with the applicable or relevant and appropriate requirements (ARARs) identified in the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13 Record of Decision (DOE-ID 1999) and the *INEEL CERCLA Disposal Facility Complex Remedial Action Work Plan* (DOE-ID 2003a). The Remedial Action Work Plan identified "clean closure" as the closure approach for ICDF waste storage areas. The ARAR for closure of ICDF facilities used for waste storage is Idaho Administrative Procedures Act (IDAPA) 58.01.05.008 (40 CFR 264 [Subpart G]). As a CERCLA activity, the substantive requirements of this closure requirement will be performed. This plan specifies the path forward to achieve clean closure of the SSA tank system. As identified in Section 4 of this document, closure of the tanks will be accomplished with the decontamination of the CERCLA tanks that stored wastewater, followed by the sampling of any residuals remaining in the tanks, and performance of a CERCLA risk assessment, using a risk-based standard (10^{-4} and a hazard index of 1) to ensure the closure is protective of human health and the environment.

2. FACILITY DESCRIPTION

The SSA is located in the southwest portion of the Idaho Nuclear Technology and Engineering Center (INTEC) facility, inside the security fence (see Figure 1). The SSA tank system is located on the paved and fenced area of the SSA. Eight tanks were delivered in September 2000 and are positioned in two rows of four each on the asphalt pad. Two additional tanks were delivered to the INEEL during September and October 2002 and are located adjacent to one another on the asphalt pad. The two newer tanks have not been placed in service. In addition, one of the original tanks has not been placed in service, as it was identified as a "reserve tank" to be used in the event of an emergency should one of the tanks storing waste develop a leak.

2.1 Storage Tanks Description

The SSA tank system includes 10 aboveground CERCLA waste storage tanks, eight of which consist of 8,500-gal, vertical, closed-top storage tanks sitting inside vertical, open-top vessels with capacities of approximately 9,800 gal. These tanks were delivered in September 2000. The outside, open-top vessels provide a secondary containment function for the primary storage vessel on the inside Both vessels are constructed of polyethylene.

The eight 8,500-gal tanks include only the storage tank and the 9,800-gal secondary containment structure. There are no other components to the tanks, such as hard connections of piping or pumps to the tanks. Aqueous waste is pumped to the tank system from portable containers using a portable pumping system with flexible hoses. The hoses are placed into the tops of the delivery container and the storage tank. The interiors of the storage tanks and the secondary containment structures can be accessed only from the top, as there are no plugs, ports, or other openings on the bottoms or sides of either vessel.

Seven of the 8,500-gal tanks currently contain mixed aqueous waste (WAG 3, OU 3-13 Groups 4 and 5 purge water):

- Tank 1 began receiving waste April 9, 2001
- Tank 3 began receiving waste May 25, 2001.
- Tanks 2 and 8 began receiving waste June 4 and 27, 2001, respectively.
- Tank 4 began receiving waste September 23, 2002.
- Tanks 5 and 7 began receiving waste September 25, 2002.
- Tank 6 is the tank reserved for use in the event of a spill or a leak and has not been used

According to the daily inspection logs, the tank system has not leaked, nor has there been a spill during operation. After the tank system is emptied and decontaminated, daily inspections will no longer be required.

The two SSA tanks that were moved to the SSA in September and October 2003, along with the reserve tank (Tank 6), have not been used to store CERCLA waste and will not be required to undergo closure decontamination activities before being made available for reuse.

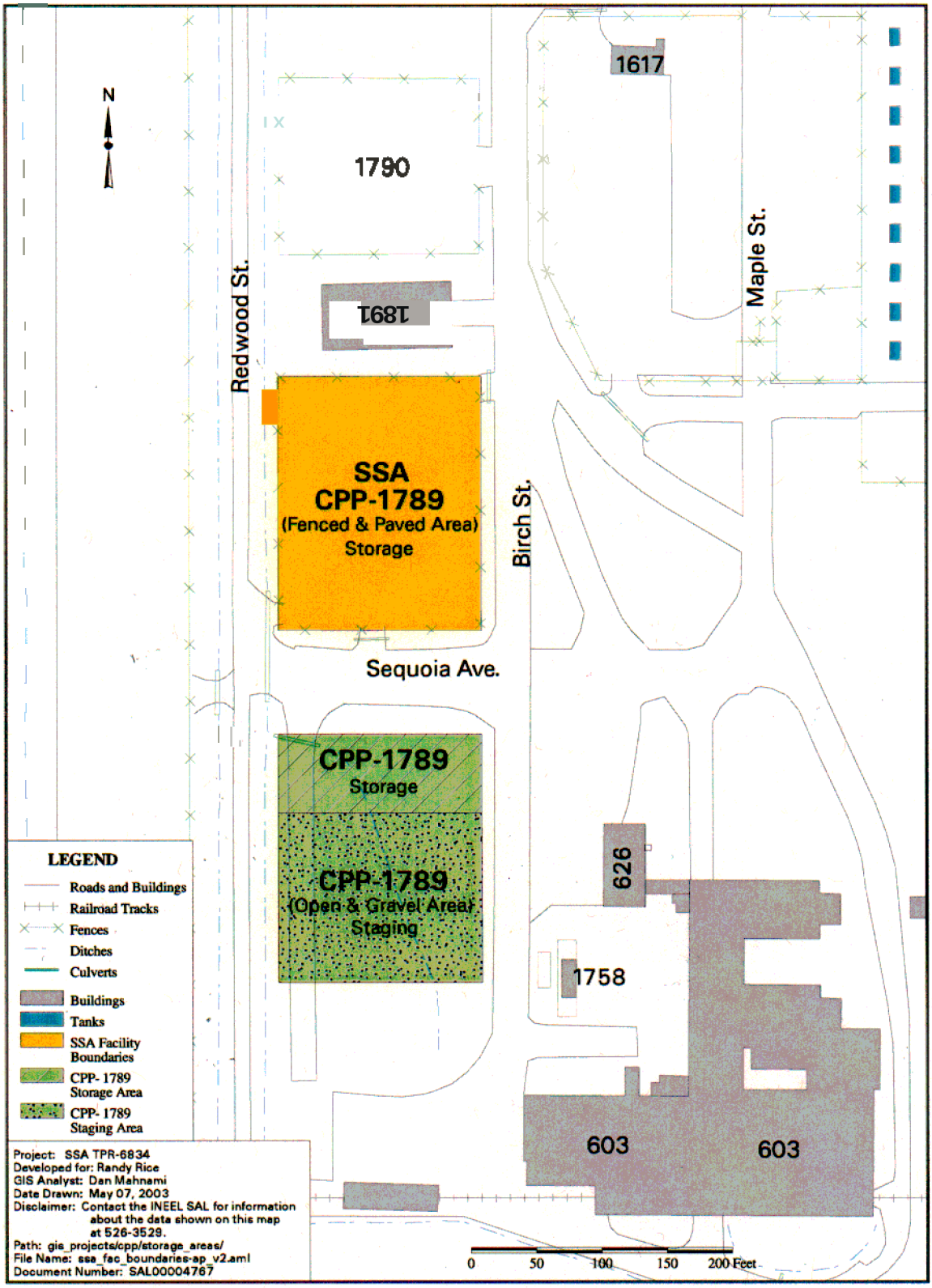

Figure 1. Location of the SSA at the INTEC and location of the SSA tank system at the SSA.

3. CERCLA WASTE WATER STORAGE TANKS MAXIMUM WASTE INVENTORIES

3.1 Maximum Inventory

The CERCLA wastewater in tank storage at the SSA consists of groundwater from wells associated with implementation of the WAG 3, Group 4 and Group 5, remediation activities. In preparation for winter, the wastewater in the tanks is being removed and transferred to the ICDF evaporation pond. The removal of the wastewater and subsequent closure of the tanks will be subject to weather conditions. The maximum estimated waste inventory stored in the seven tanks used for CERCLA waste storage is 45,061 gal.

3.2 Contaminants of Concern

As required by the CERCLA ARAR for the Group 4 and Group 5 remediation activities, a hazardous waste determination was performed (IWTS, 3009N)[a] for this waste stream, and characterization information was compiled from process knowledge and from data derived from samples analyzed using approved analytical procedures. The CERCLA wastewater from saturated zones associated with Groups 4 and 5 remediation activities carries the waste numbers F001, F002, F005, and U134 (Table 1). Table 2 provides the constituents that are present in the waste stream based on sampling of the wastewater.

Table 1. Resource Conservation and Recovery Act (RCRA) listed hazardous waste numbers and applicable constituents for the SSA tank system.

RCRA Waste Codes	Hazardous Constituent
F001	1,1,1-trichloroethane, carbon tetrachloride, and trichloroethylene
F002	1,1,1-trichloroethane, tetrachlorethylene, and trichloroethylene
F002	Carbon tetrachloride
F005	Benzene, carbon disulfide, pyridine, toluene
U134	Hydrogen fluoride and fluoride

a. Material and Waste Characterization Profile No. 3009N, from INEEL Integrated Waste Trackmg System (IWTS) (not publicly available).

Table 2. RCRA contaminants of concern for the **SSA** tank system closure.

Contaminant of Concern	Mean Concentration of Samples (µg/L)[a]
Metals	
Aluminum	6,186.0
Arsenic	9.1
Barium	230.0
Calcium	64,326.3
Chromium	197.6
Cobalt	21.1
Copper	32.7
Iron	12,250.0
Lead	10.6
Magnesium	18,371.1
Manganese	222.0
Mercury	0.36
Nickel	72.8
Potassium	5,950.5
Sodium	63,579.5
Zinc	157.2
Inorganics	
Chloride	87.5
Fluoride	0.23
Nitrate/nitrite-N	12.49
Sulfate	37.3
Organics	
Carbon disulfide	2.0
Tetrachloroethene	2.0
Toluene	2.0
Methylene chloride	7.0
Acetonitrile	66.0

a. Sample data from Material and Waste Characterization Profile (IWTS, 3009N) May 2,2001.

4. CLOSURE OF THE ACTIVE PURGE WATER STORAGE TANKS [IDAPA 58.01.05.008 (40 CFR 264.111)]

This section specifies the activities required to comply with the closure performance standard (IDAPA 58.01.05.008 [40 CFR 264.111]) for the SSA tank system that was used to store CERCLA wastewater and provides details on how the activities will be completed.

4.1 Activities Required to Achieve Compliance with the Closure Performance Standard

The following sections describe the activities required to achieve the closure performance standard ARAR. As a CERCLA activity, the substantive requirements of the closure standards identified below will be performed.

4.1.1 Standard 1

The owner or operator must close the facility in a manner that minimizes the need for further maintenance (IDAPA 58.01.05.008 [40 CFR 264.111(a)]).

The activities required to minimize further maintenance of the SSA tank system are

1. Waste will be removed and the tanks decontaminated.

2. Residuals remaining in the tank following the removal of the waste will be removed as described below. The planned decontamination activities will remove the waste and decontaminate the tanks and minimize the need for further maintenance. As specified in Section 3, CERCLA wastewater is currently stored in seven of the 10 tanks (Tanks 1, 2, 3, 4, 5, 7, and 8).

Aqueous waste removed from the tanks will be managed as described in Section 4.2 of this Closure Plan. After the below-described decontamination process is completed, daily inspections will cease.

4.1.2 Standard 2

The owner or operator must close the facility in a manner that will control, minimize, or eliminate, to the extent necessary to protect human health and the environment, postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere (IDAPA 58.01.05.008 [40 CFR 264.111(b)]).

The activities required to accomplish this closure are

1. Waste will be removed and the tanks decontaminated (addressed under Standard 1)

2. Residuals remaining in the tank following the removal of the waste will be removed as described below. The planned decontamination activities will remove the waste and decontaminate the tanks to eliminate the risk to human health and the environment due to contaminants and prevent postclosure escape of hazardous waste. As specified in Section 3, CERCLA wastewater is currently stored in seven of the 10 tanks (Tanks 1, 2, 3, 4, 5, 7, and 8) (addressed under Standard 1).

The tank system identified in Section 2.1 will be decontaminated as specified below and the removed waste and decontamination effluent will be managed as described in Section 4.2. The seven tanks (Tanks 1, 2, 3, 4, 5, 7, and **8)** will be decontaminated, as follows:

- Tanks will be decontaminated using high-pressure water with no less than 200 gal of water for each rinse cycle. Washing will begin at the top portion of the tank and wash down the sides of the tank toward the heel. (It is conservatively estimated that approximately 4 in. of heel [200 gal] will remain in the bottom of the tank prior to decontamination.)

- The wash water mixed with the heel will be pumped to a portable container for transport to the ICDF.

- Raw water will be used for the iterative wash cycle process, which will be performed two times.

- A field sampling plan will be prepared. In compliance with the field sampling plan, a sample will be taken of any residuals remaining in the decontaminated tanks to determine if the closure performance standards have been achieved. The constituents that will be sampled for are the RCRA contaminants of concern that are identified in Table 2.

- A CERCLA risk assessment will be calculated, using the results from the field sampling. The performance levels to be achieved will be a risk less than 10^{-4} and hazard quotient of less than 1 for a worker scenario. This risk assessment will assume a conservative scenario where all constituents are released to the environment simultaneously. The risk assessment will evaluate whether a release would adversely impact workers or the environment.

- Upon completion of the second decontamination rinse and a determination that the performance closure standards are achieved, the daily inspections for the SSA tank system will cease.

- The rinse water will be managed as specified in Section 4.2.

4.1.3 Standard 3

The owner or operator must close the facility in a manner that complies with the closure requirements of 40 CFR 264, Subpart G, including, but not limited to, the requirements of 40 CFR 264.197, 40 CFR 264.228, 40 CFR 264.258, 40 CFR 264.280, 40 CFR 264.310, 40 CFR 264.351, 40 CFR 264.601, 40 CFR 264.603, and IDAPA 58.01.05.008 (40 CFR 264.111(c)).

The SSA tank system is subject to the closure requirements specified in 40 CFR 264.197. The purpose of this Closure Plan is to attain clean closure in accordance with 40 CFR 264.197(a). Therefore, the relevant closure performance standard identified in IDAPA 58.01.05.008 (40 CFR 264.197) is

- At closure of a tank system, the owner or operator must remove or decontaminate waste residuals, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless 40 CFR 261.3(d) of this chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for tank system must meet all requirements specified in Subpart G and H of this part.

The activities required to close the tank system in accordance with 40 CFR 264.197(a) are

1. Waste will be removed and the tank system will be decontaminated (addressed under Standard 1).

According to daily inspection logs, the tank system has not leaked, nor has there been a spill during operation of the tank system. Therefore, this plan does not require sampling of any soils. It is noted that the future closure of the SSA's waste storage area where these tanks are located will reevaluate this area for spills and releases.

4.2 Waste Management (40 CFR 264.114)

Wastes will be managed as CERCLA remediation waste in accordance with the SSA Waste Management Plan (DOE-ID 2003b). It is planned that the decontaminated tanks will be offered for reuse at the INEEL. If it is determined that the tanks cannot be reused at the INEEL, they will be cut into manageable pieces and disposed of in accordance with the SSA Waste Management Plan.

5. CLOSURE SCHEDULE

This closure schedule for the SSA tank system is subject to acceptable weather conditions and personnel availability. The planned closure schedule is (1) aqueous waste removal, (2) rinse, and (3) characterization activities, planned to be completed by December 15, 2003, with certification to be obtained from the professional engineer by April 2004. However, adverse weather and personnel availability may cause closure activities to be rescheduled and certification obtained from the professional engineer by August 2004.

Should unexpected events during the closure period require modification of the closure activities or closure schedule, the Closure Plan will be amended and the revised plan and rationale for the changes will be prepared.

6. CERTIFICATION OF CLOSURE

When closure activities achieve the closure performance standards outlined in this Closure Plan, a certification of closure of the SSA tank system will be completed in accordance with the substantive requirements of IDAPA 58.01.05.008 (40 CFR 264.115). The certification will document the completion of closure activities in accordance with this Closure Plan.

7. REFERENCES

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